

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A radar system comprising:
an aircraft for detecting buried objects from the air, for overflying a target area of interest;
a radar transmitter, carried by the aircraft, for producing a pulsed radar signal having a carrier frequency of at least three gigahertz;
a plurality an array of radar receiving antennas, carried by the aircraft for receiving a reflected signal produced by reflection of said radar signal and forming a real aperture for cross track resolution of the objects ~~an antenna array, for receiving a reflected signal produced by reflection of said radar signal;~~ and
a processor for generating a three-dimensional image of said object from the reflected signal.
2. (Previously presented) The radar system of claim 1, wherein the radar signal carrier frequency is within a range of three to ten gigahertz.
3. (Original) The radar system of claim 1, wherein said processor performs synthetic aperture beam processing based on movement of said radar transmitter and said antenna array

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relative to the target.

4. (Original) The radar system of claim 1, wherein said radar transmitter comprises a frequency-stepped pulse compression radar unit.
5. (Original) The radar system of claim 1, wherein said radar transmitter comprises an impulse-modulated radar unit.
6. (Original) The radar system of claim 1, wherein said aircraft includes wings and said array is disposed along said wings.
7. (Original) The radar system of claim 6, wherein said aircraft further comprises first and second booms each extending laterally outwardly from one of said aircraft wings, and said array includes radar receiving antennas disposed along each of said booms.
8. (Original) The radar system of claim 7, wherein said booms comprise extendable booms.
9. (Previously Presented) The radar system of claim 1, wherein the signal processor filters out a portion of the reflected signal corresponding to reflection from the surface of the target area.

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10. (Previously Presented) The radar system of claim 1, wherein said processor comprises an on-board processor disposed on the aircraft.
11. (Original) The radar system of claim 1, wherein the processor comprises an off-board processor.
12. (Currently Amended) A method for detecting a subsurface object in a target area from an aircraft, said method comprising:
- transmitting a pulsed radar signal having a carrier frequency of at least three gigahertz using a radar transmitter disposed on the aircraft;
 - receiving a return of the transmitted signal reflected by the subsurface object with ~~at least one of a plurality~~ an array of radar receiving antennas disposed on the aircraft, said array and forming a real aperture for cross-track resolution receiving antenna array; and
 - generating a three-dimensional image based on the received return of the transmitted signal.
13. (Previously Presented) The method of claim 12, wherein the radar signal frequency is within a range of three to ten gigahertz.
14. (Original) The method of claim 12, further comprising the step of identifying the object from the three-dimensional image.

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15. (Original) The method of claim 14, wherein the step of identifying the object comprises the step of comparing the generated three-dimensional image to a stored image.
16. (Original) The method of claim 15, wherein the stored image comprises an image identifiable as a mine.
17. (Original) The method of claim 12, wherein the step of transmitting a radar signal comprises selecting a desired transmitting frequency to maximize image resolution.
18. (Original) The method of claim 12, further comprising a step of filtering out portions of the return signal corresponding to reflection of the target area surface.
19. (Previously Presented) The radar system of claim 1, wherein the carrier frequency signal is frequency modulated or phase modulated.
20. (Previously Presented) The radar system of claim 1, wherein the carrier frequency signal is frequency modulated.
21. (Previously Presented) The radar system of claim 1, wherein the carrier frequency signal is greater than ten gigahertz.

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22. (Previously Presented) The method of claim 12, wherein the carrier frequency signal is greater than ten gigahertz.
23. (Previously Presented) The radar system of claim 6, further comprising at least one boom extending laterally outwardly from one of said aircraft wings, wherein the array includes radar receiving antennas disposed along the boom.
24. (Previously Presented) The radar system of claim 9, wherein the signal processor filters out a portion of the reflected signal corresponding to reflection from the earth's surface by range-gating.
25. (Previously Presented) The method of claim 12, wherein the step of transmitting a pulsed radar signal comprises using a plurality of radar transmitters spaced transversely on the aircraft to transmit a plurality of pulsed radar signals.
26. (Previously Presented) The method of claim 15, wherein the stored image comprises an image identifiable as a mine, munition, or other object of interest.
27. (Currently Amended) A radar system for detecting buried objects from an aircraft overflying a target area of interest, the system comprising:

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a radar transmitter being carried by the aircraft, the radar transmitter producing a pulsed radar signal having a carrier frequency of at least three gigahertz;

~~a plurality~~ an array of radar receiving antennas being carried by the aircraft for receiving a reflected signal produced by reflection of said radar signal and forming ~~an antenna array and a real aperture for cross-track resolution of the objects~~ for receiving a reflected signal produced by reflection of said radar signal; and

a processor for generating a three-dimensional image of said object from the reflected signal.

28. (New) A radar system according to claim 27, wherein said array comprises at least three radar receivers.

29. (New) A radar system according to claim 27, wherein said array is densely populated.

30. (New) A radar system according to claim 27, wherein the array receivers have a half wavelength spacing.

31. (New) A radar system according to claim 27, wherein said receiver array has a gain of about 32 dB.

32. (New) A method according to claim 12, wherein said transmitter and said receivers have

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an altitude between about forty feet and about two hundred forty feet during said transmitting and said receiving.

33. (New) A radar system for detecting buried objects from an aircraft overflying a target area of interest, the system comprising:

a radar transmitter being carried by the aircraft, the radar transmitter producing a pulsed radar signal having a carrier frequency of at least one gigahertz;

an array of radar receiving antennas being carried by the aircraft for receiving a reflected signal produced by reflection of said radar signal and forming a real aperture for cross-track resolution of the objects; and

a processor for generating a three-dimensional image of said object from the reflected signal.